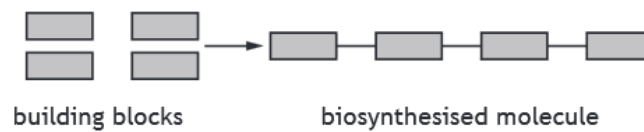


Metabolic Pathways

10. Cell membranes contain pumps that actively transport substances.
Which of the following forms the major component of membrane pumps?

- A Protein
- B Phospholipid
- C Nucleic acid
- D Cellulose

11. The diagram shows how a molecule might be biosynthesised from building blocks in a metabolic pathway.

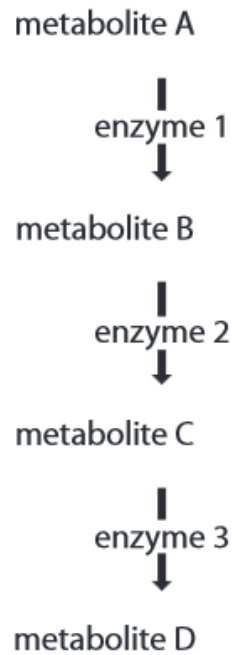


Which row in the table describes the metabolic process shown in the diagram and the energy relationship involved in the reaction?

	Metabolic process	Energy relationship
A	anabolic	energy used
B	anabolic	energy released
C	catabolic	energy used
D	catabolic	energy released

12. An inhibitor of an enzyme-catalysed reaction can be described as competitive if
- A its effect can be reversed by increasing substrate concentration
 - B it is the end-product in a metabolic pathway
 - C it prevents the gene encoding the enzyme from being switched on
 - D it changes the shape of the active site.

13. The stages of an enzyme-catalysed metabolic pathway are shown.



In feedback inhibition

- A enzyme 3 binds with enzyme 1
- B enzyme 3 binds with metabolite A
- C metabolite D binds with enzyme 1
- D metabolite D binds with metabolite A.

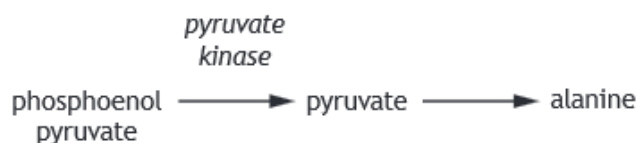
(b) (i) The presence of a Philadelphia chromosome causes a form of leukaemia through the over-production of an enzyme.

A drug has been used to successfully treat this form of leukaemia by binding at the active site of the enzyme.

Name the type of enzyme inhibition shown by this drug.

1

3. Part of a metabolic pathway used by cells to produce the amino acid alanine is shown.



Alanine is a non-competitive, feedback inhibitor of the enzyme pyruvate kinase.

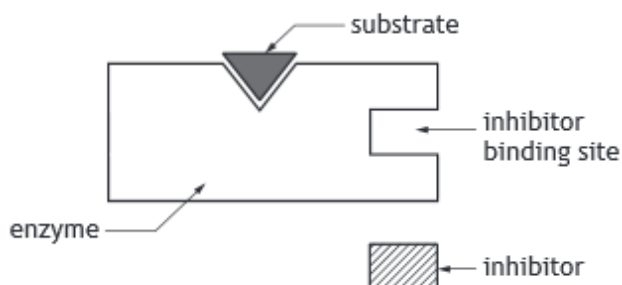
The following statements refer to the metabolic pathway.

- 1 Pyruvate kinase reduces the activation energy needed to convert phosphoenol pyruvate into pyruvate.
- 2 Phosphoenol pyruvate is the substrate for pyruvate kinase.
- 3 Alanine can bind to the active site of pyruvate kinase.

Which of these statements are correct?

- A 1 and 2 only
- B 1 and 3 only
- C 2 and 3 only
- D 1, 2 and 3

7. The diagram shows an enzyme, its substrate and a substance which inhibits it.



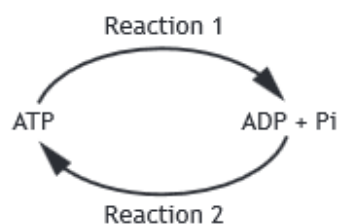
The following statements describe some features of enzyme inhibition.

- 1 The inhibitor binds to the active site.
- 2 The effect of the inhibitor is reduced by increasing the substrate concentration.
- 3 The inhibitor is non-competitive.

Which of these statements apply to the inhibitor shown in the diagram?

- A 1 only
- B 3 only
- C 1 and 2 only
- D 2 and 3 only

9. ATP is recycled to transfer energy within cells. The diagram shows two reactions involving ATP.



Which row in the table describes Reaction 1 and Reaction 2?

	<i>Reaction 1</i>	<i>Reaction 2</i>
A	catabolic and energy released	anabolic and energy required
B	anabolic and energy released	catabolic and energy required
C	catabolic and energy required	anabolic and energy released
D	anabolic and energy required	catabolic and energy released

7. In metabolic pathways, the rates of reaction can be affected by the presence of enzyme inhibitors.

Which row in the table below is correct?

	<i>Type of inhibition</i>	<i>Inhibitor binds to active site</i>	<i>Effect of increasing substrate concentration on inhibition</i>
A	competitive	yes	reversed
B	non competitive	yes	unaffected
C	competitive	no	unaffected
D	non competitive	no	reversed

A Describe and compare anabolic and catabolic reactions.

4